I Claim

1. Apparatus for controlling the optical coupling of an input optical beam to one of a plurality of output optical facilities, comprising

a plurality of lenses, each lens aligned to couple a received optical beam to one of the plurality of output optical facilities,

a plurality of output optical facilities, each optical facility aligned co-axially with a corresponding one of the plurality of lenses, and wherein

contiguous pairs of the plurality of lenses are arranged to have a predetermined space between such contiguous pairs, so that when the direction of a received beam is misaligned to a destination lens of a contiguous pair, only a first portion of the received beam gets coupled to the corresponding output facility of that destination lens to become an output beam and a second portion of the received beam propagates into the predetermined space so as not to be coupled to any of the plurality of output optical facilities.

2. The optical coupling control apparatus of claim 1 being part of an optical beam-steering switching apparatus that also includes

an optical beam-steerer for receiving an input optical beam and for changing the direction of the received beam relative to one of the plurality of lenses so as to change the first portion of the received beam propagated to the corresponding output facility.

3. The optical coupling control apparatus of claim 1 wherein the direction of the propagation is reversed for the input and output beams so that the input beam of claim 1 becomes an apparatus output beam and the output beam of claim 1 becomes an apparatus input beam and wherein the apparatus input beam is received from one of

the plurality of output optical facilities and wherein the apparatus enables the received apparatus input beam to be coupled to become the output beam.

4. The optical coupling control apparatus of claim 2 wherein

the optical beam-steerer is a Micro Electro Mechanical Systems (MEMS) apparatus.

5. The optical coupling control apparatus of claim 1 wherein

wherein the plurality of lenses are arranged in a one-dimensional array.

6. The optical coupling control apparatus of claim 1 wherein

wherein the plurality of lenses are arranged in a two-dimensional array.

7. The optical coupling control apparatus of claim 1 wherein

the diameter D of each lens of the plurality of lenses is the same and the separation P between contiguous pairs is chosen to create a gap, P-D, that provides a predetermined attenuation range to a destination output facility without exceeding crosstalk requirements to non-destination output facilities.

8. Apparatus for controlling the optical coupling of an input optical beam to one of a plurality of output optical facilities, comprising

an input lens for receiving an input optical beam,

a plurality of output lenses, each lens aligned to couple a received optical beam to one of the plurality of output optical facilities, each of the received optical beams being produced from the input beam,

a plurality of output optical facilities, each optical facility aligned co-axially with a corresponding one of the plurality of lenses, and wherein

the plurality of lenses are arranged in a one-dimensional array, the input lens located between and contiguous to two output lenses to form a three lens group, the remaining lenses of the plurality of lenses being arranged in contiguous pairs, the three lens group and the contiguous pair of the one-dimensional array being arranged to have a predetermined space between any contiguous pair and another contiguous pair or said three lens group, so that when a received beam is misaligned to a destination lens of a contiguous pair, only a first portion of the received beam gets coupled to the corresponding output facility of that destination lens and a second portion of the received beam propagates into the predetermined space so as not to be coupled to any lens of the plurality of output optical facilities.

9. The optical coupling control apparatus of claim 8 being part of an optical beam-steering switching apparatus that also includes

an optical beam-steerer for receiving the input optical beam and for changing the direction of the received beam relative to one of the plurality of lenses so as to change the first portion of the received beam propagated to the corresponding output facility.

10. Apparatus for controlling the optical coupling of an input optical beam from an input waveguide to one of a plurality of output optical waveguides, comprising

a plurality of output optical waveguides, each separated by a predetermine gap from the input waveguide to enable it to receive the input optical beam without the use of a lens and wherein

contiguous pairs of the plurality of output optical waveguides are arranged to have a predetermined space between such contiguous pairs, so that when the direction of the received beam is misaligned to a destination optical waveguide of a contiguous pair, only a first portion of the received beam gets coupled to the corresponding output optical waveguide and a second portion of the received beam propagates into the predetermined space so as not to be coupled to any of the plurality of output optical optical waveguides.